Health and Safety Plan

Residential Remedial Action

For the
Private Residences
Located at McComas Street
Baltimore, Maryland

Prepared for

Honeywell International Inc.

June 2007

Prepared by

CH2MHILL

HEALTH AND SAFETY PLAN

Private Residences
Mc Comas Street
Baltimore, Maryland

PHONE

Project Number:

Project Manager: Kevin Flynn/NJO 215-859-2621

Safety Coordinator (SC): Joe Murphy/HRO 757-262-7597

Honeywell H&S Program Manager (HSPM): Bill Berlett.....773-693-3800 x-316
Cell: 847-770-0209

Project H&S Manager (HSM): Bill Berlett/CHI ..... see above

Preparation Date: June 20, 2007

Expiration Date: December 31, 2007

APPROVALS

Project Manager:

_____
(DATE)

Safety Coordinator

_____
(DATE)

Honeywell Program or Project Health and Safety Manager:

June 22, 2007
CIH/CSP (DATE)

This Health and Safety Plan is valid only for this specific project as described in Section 3.0. It is not to be used for other projects or subsequent phases of this project without the written approval of the Honeywell Program Health and Safety Manager. **A copy of this plan is to be maintained at the site at all times.**

Change Management Form

Honeywell Project HS&E Change Management Form

This evaluation form should be reviewed on a <u>continuous</u> basis to determine if the current site health and safety plan adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.

Project Task:	Remedial Construction		
Project Number:		Project/Task Manager:	Kevin Flynn/NJO
Name:	209 McComas Street Baltimore, Maryland	Safety Coordinator	Joseph Murphy/HRO

	Evaluation Checklist	Yes	No
1.	Have the CH2MHILL staff listed in the original HSP/FSI changed?		
2.	Has a new subcontractor been added to the project?		
3.	Is any chemical or product to be used that is not listed in Attachment 2 of the plan?		
4.	Have additional tasks been added to the project, which were not originally addressed in the plan?		
5.	Have new contaminants or higher than anticipated levels of original contaminants been encountered?		
6.	Have other safety, equipment, activity or environmental hazards been encountered that are not addressed in the plan?		

If the answer is "YES" to Question 3, an HSP/FSI revision is NOT needed. Please take the following actions:

- Add the chemical to Attachment 2;
- Ensure employees handling the chemical are trained; and
- Ensure training documentation is added to Attachment 3.

If the answer is "YES" to Questions 1, 2 or 4-6, an HSP/FSI revision MAY BE NEEDED. Please contact Bill Berlett (773-693-3800 x316) directly.

Emergency Contacts

24-hour CH2M HILL Emergency Beeper – (720) 286-4911

CH2M HILL Occupational Health Nurse – 1-800-756-1130

Medical Emergency – 911 **Fire/Spill Emergency – 911** **Security & Police – 911** Local Facility Emergency Response Number: N/A	**CH2M HILL Medical Consultant** Health Resources Dr. Jerry H. Berke, M.D., M.P.H. 600 West Cummings Park, Suite 3400 Woburn, MA 01801-6350 1-781-938-4653 (8 am to 11 pm EST) 1-800-350-4511 (after hours and on weekends) (After hours calls will be returned within 20 minutes)
Client Contact Name: Chris French Company: Honeywell Title: Remediation Manager Phone: 973-455-4131	**Site Contact** Name: Sibyl Dinkins Company: CH2M Hill Title: Communications Specialist Phone: 410-869-2811
Honeywell Health, Safety & Environment Program Manager (HSPM) Name: Bill Berlett/CHI Phone: 773-693-3800 x 316 Cell: 847-770-0209 Fax: 773-693-3823	**Environmental Compliance Coordinator (ECC)** Name: Linda Hickok/SYR Phone: (315) 422-7250 x229
Project Health & Safety Manager (HSM) Name: Bill Berlett Phone: see above Cell: Fax:	**Safety Coordinator (SC)** Name: Joe Murphy/HRO Phone: 757-262-7597 Cell:
Project Manager (PM) Name: Kevin Flynn Phone: 973-316-0159 Cell Phone: 215-859-2621	**Regional Human Resources Department (Workers' Compensation Contact)** Name: Cindy Bauder/WDC Phone: 703/471-6405 ext. 4243
Federal Express Dangerous Goods Shipping Phone: 800/238-5355 **CH2M HILL Emergency Number for Shipping Dangerous Goods** Phone: 800/255-3924	**Worker's Compensation:** Contact Regional HR dept. to have form completed or contact Albert Jerman after hours: 303-741-5927 **Automobile Accidents:** Rental: Linda Anderson/DEN 720-286-2401 CH2M HILL owned vehicle: Zurich Insurance Co. 800-987-3373
Facility Alarms: N/A	**Evacuation Assembly Area(s):** TBD by SC
Facility/Site Evacuation Route(s): TBD by SC	

Hospital Name/Address:

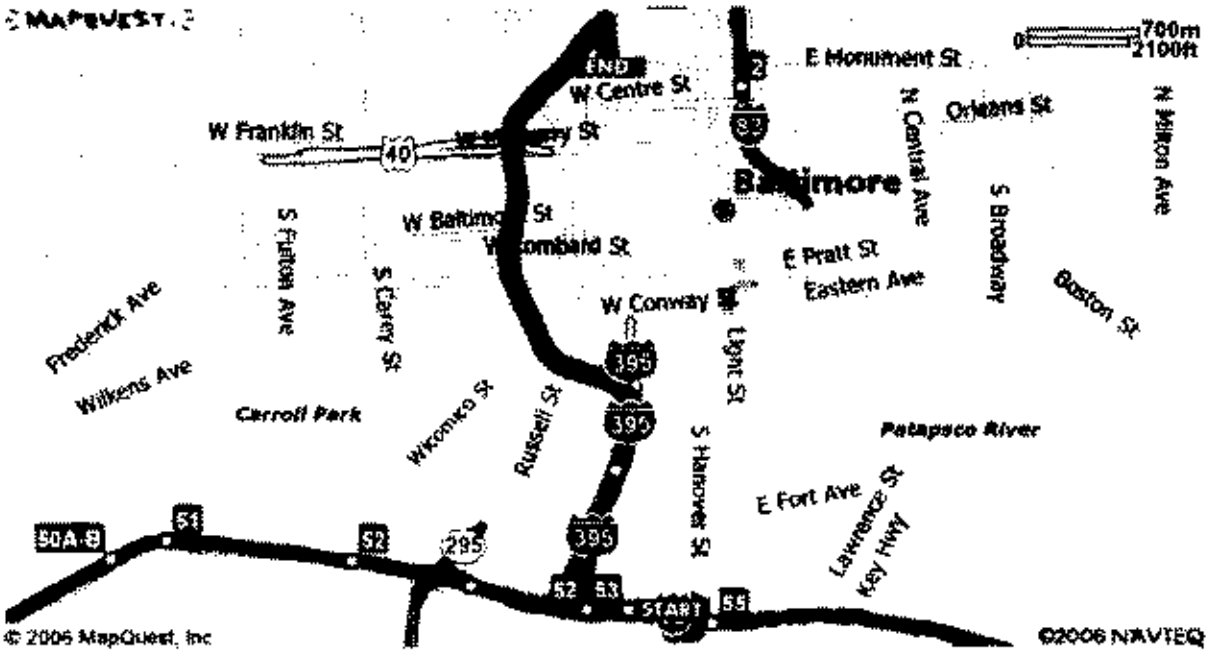
Directions to Hospital

Maryland General Hospital

827 Linden Avenue – Baltimore, Maryland

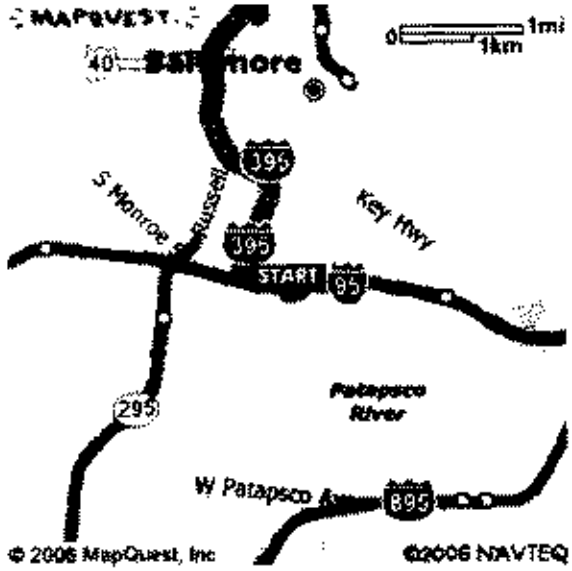
Phone: 410-225-8000

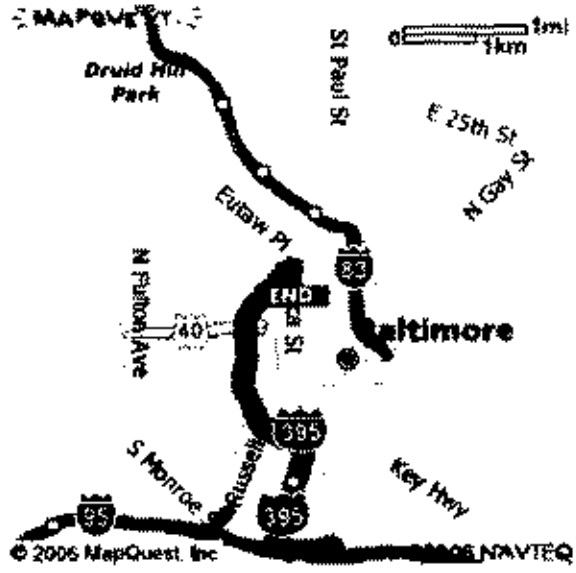
Directions		Distance
Total Est. Time: 7 minutes	**Total Est. Distance:** 3.52 miles	
START	**1:** Start out going SOUTH on RACE ST toward W MCCOMAS ST.	<0.1 miles
	2: Turn LEFT onto W MCCOMAS ST.	<0.1 miles
	3: Turn LEFT onto MD-2 / S HANOVER ST.	<0.1 miles
95	**4:** Merge onto I-95 S toward I-395 / WASHINGTON / DOWNTOWN.	0.3 miles
395	**5:** Merge onto I-395 N via EXIT 53 toward DOWNTOWN / M L KING BLVD.	0.5 miles
EXIT	**6:** Take the M.L. KING JR. BLVD exit.	0.3 miles
	7: Turn SLIGHT LEFT onto MARTIN LUTHER KING JR BLVD.	1.8 miles
	8: Stay STRAIGHT to go onto W READ ST.	<0.1 miles
	9: Turn RIGHT onto LINDEN AVE.	0.1 miles
END	**10:** End at **Maryland General Hospital:** 827 Linden Ave, Baltimore, MD 21201, US	
Total Est. Time: 7 minutes	**Total Est. Distance:** 3.52 miles	



Start:
2000 Race St
Baltimore, MD 21230, US

End:
Maryland General Hospital:
410-225-8000
827 Linden Ave, Baltimore, MD 21201, US





Site Map

This page is reserved for a Site Map.

Note locations of Support, Decontamination, and Exclusion Zones; site telephone; first aid station; evacuation routes; and assembly areas.

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2 Job Hazard Analysis
3 Daily Tailgate Safety Briefing Form
4 Pre-Task Safety Plan
5 Project Activity Self-Assessment Checklists
6 Safe Work Observation Form
7 Project-Specific Chemical Product Hazard Communication Form
8 Applicable Material Safety Data Sheets
9 Chemical-Specific Training Form
10 Biological Hazard Information
11 Drug Testing Hospital Kit Notice
12 Incident Report Form and Root Cause Investigation Information

Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
APR	air-purifying respirator
As	Arsenic
cm	centimeter
CNS	central nervous system
COPC	chemical of potential concern
CPR	cardiopulmonary resuscitation
dBA	decibel (A-weighted scale)
DEET	N,N-diethyl-meta-toluamide
DOT	Department of Transportation
ECC	Environmental Compliance Coordinator
GFCI	ground fault circuit interrupter
Hazwoper	Hazardous waste operations and emergency response
Honeywell	Honeywell International Inc.
HR	heart rate
HS&E	health, safety, and environment
HSM	Health and Safety Manager
HSPM	Health and Safety Program Manager
IDLH	immediately dangerous to life and health
IRF	incident report form
JHA	job hazard analysis
LID	Legal and Insurance Department
MSDS	material safety data sheet
NIOSH	National Institute for Occupational Safety and Health
NSC	National Safety Council
OSHA	Occupational Safety and Health Administration

PAPR	powered air-purifying respirator
PEL	permissible exposure limit
PFD	personal flotation device
PID	photoionization potential
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
PTSP	pre-task safety plan
RES	Remediation and Environmental Services
RQ	reportable quantity
SC	Safety Coordinator
SCBA	self-contained breathing apparatus
SOP	standard of practice
SPCC	spill prevention, control, and countermeasures
SSR	Subcontractor Safety Representative
TLV	threshold limit value
TSDF	treatment, storage, and disposal facility

1.0 Introduction

1.1 About This Document

This Health, Safety and Environment (HS&E) Plan will be kept on the site during all field activities conducted under the Honeywell International Inc. (Honeywell) Alliance program. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Health, Safety, and Environmental Protection (HS&E) Program Manual*. In addition, this plan adopts procedures in the project Work Plan and incorporates applicable elements of Honeywell's HS&E requirements. The Safety Coordinator (SC) is to be familiar with the SOPs contained in the HS&E Program Manual and the contents of this plan. The project Health and Safety Manager (HSM) must review and approve any changes to this plan.

CH2M HILL personnel and subcontractors must sign the CH2M HILL Employee Sign-Off Form included in Attachment 1 after reading/reviewing this HS&E Plan.

1.2 Site Background

The Site is situated in a residential area that consists of seven (7) row homes, which comprise the McComas street site. Based upon sampling performed at three homes by the Maryland Department of the Environment (MDE), surface soil samples present levels of arsenic above the State of Maryland residential standards. Lead has also been detected above residential standards. The MDE has directed that the soils be removed to a depth of three inches. Honeywell is prepared, on a voluntary basis, to immediately commence work to remove at least three inches of soil from the back yards, vacuum loose dust and replace it with clean soil or concrete, and restore the properties, including the planting of grass and other landscaping. Because of engineering constraints (the need for an adequate structural base for the concrete) the removal will typically involve more than three inches of soil.

1.3 Description of Tasks

Refer to project documents (e.g.,project Work Plan) for detailed task information. A task hazard analysis has been performed for each task and is included below while project-specific hazard controls are provided in the next section. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Hazwoper Compliance Plan Section of this HS&E Plan for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

1.3.1 Hazwoper-Regulated Tasks

The following tasks are regulated under the Health and Safety Code (H&SC), Section 1910.120.

- Management of all Subcontractors and vendor activities onsite during the execution of this work
- Site preparation, including protecting designated vegetation and preparation of staging area
- Loose dust will be vacuumed and removed prior to and during excavation activities using equipment equipped with a HEPA particulate filter.
- Removal of existing concrete patio and common line fence
- Excavation of a nominal depth of 8-12" of soil
- Transportation of soil and concrete to a licensed landfill designated by Honeywell. Honeywell will contract with the landfill and pay for landfill disposal fees directly
- Backfill of excavated area with structural fill
- Restoration of excavated surfaces with concrete patio and planters

Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. The following tasks are considered non-hazardous.

- Site visits that do not include entry into exclusion zones
- Installation of concrete patios and steps
- Installation of Fence

1.3.2 Environmental-Regulated Tasks and Conditions

Project tasks and site conditions that can impact the environment and are otherwise subject to environmental regulation are included in Section 1.3. These items are also known as the environmental aspects of the project (activities that can interact with the environment). Environmental impacts relating to each task or condition are also presented in Section 1.3, which is used to evaluate the project's significant impacts and control measures specified in Hazard Controls and Safe Work Practices section of this HS&E Plan.

All personnel shall: (1) implement control measures described in Hazard Control Section; (2) obtain appropriate environmental training (e.g., Waste Management or Dangerous Goods Shipping) and (3) seek assistance from the regional Environmental Compliance Coordinator (ECC) for all environmental questions or issues.

1.3.3 Honeywell Permit Required Tasks

The following tasks require a Honeywell permit:

None required at this time.

1.4 Task Hazard Analysis

Table 1-1 presents the hazard analysis for work to be conducted under this HS&E Plan.

1.5 Environmental Impacts

Table 1-2 summarizes the potential environmental impacts of the work to be conducted under this HS&E Plan.

TABLE 1-1
Task Hazard Analysis Table

Tasks	POTENTIAL HAZARDS (Refer to Hazard Control Section for additional information)																										
	Aerial Lifts	Back Injury (Bending/Lifting)	Biological Hazards	Buried Utilities	Cold Stress	Confined Space Entry	Electrical	Elevated Work Areas/Falls	Entanglement	Excavations	Fires	Flying Debris/Objects	Gas Cylinders	Hand and Power Tools	Heat Stress	Heavy Equipment Exposure	Ionizing Radiation	Lockout-Tagout	Noise	Radio-Frequency Radiation	Respiratory Protection	Slips, Trips and Falls	Stairways and Ladders	Suspended Loads	Traffic Exposure	Vehicle Backing Exposure	Visible Lightning	Working Above or Near Water
Excavation – residential properties – cap materials		X	X	X			X			X		X	X	X	X	X			X			X	X	X	X	X	X	
Site Preparation – Clearing, removal of miscellaneous materials, fence removal		X	X				X					X	X	X	X	X			X			X	X		X	X	X	
Site Restoration – backfilling, re-vegetating, fence replacement, etc.		X	X	X			X					X	X	X	X	X			X			X	X		X	X	X	
Surveying		X	X				X							X	X				X			X			X	X	X	
Sampling for Waste Disposal		X	X									X		X	X	X			X			X			X	X	X	
Observation of loading material for offsite disposal			X									X			X	X			X			X		X	X	X	X	
Remediation & construction oversight			X									X	X		X	X			X			X	X		X	X	X	

TABLE 1-2
Environmental Impacts Table

Tasks/Conditions	Impacts						
	Air Pollution	Land Pollution	Land Disposal	Noise Pollution	Water Pollution	Resource Depletion	Human Hazard
Potential Lead-Based Paint	X	X	X				X
Chemical/Petroleum Storage or Transport	X	X			X		X
Excavate, Clearing or Grading	X	X		X			
Waste (Haz/Non-Haz) Mgmt, Transport and Disposal	X	X	X		X		X

2.0 Hazard Controls and Safe Work Practices

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the SC for clarification. In addition to the hazard controls specified in this section, the following are required for Honeywell projects.

2.1 Administrative Controls

2.1.1 HS&E Plans

CH2M HILL requires HS&E plans for all field projects and subcontractors are required to submit detailed Job Hazard Analysis for their activities. The HS&E plan provides a risk analysis of each task and identifies the potential hazards and control measures (including personal protective equipment (PPE) and air monitoring requirements) for each task.

2.1.2 Job Hazard Analysis

A job hazard analysis (JHA) is required by CH2M HILL for all tasks unless the HSM specifically determines it is unnecessary. The JHA provides a step-by-step analysis of the activity being performed and identifies the equipment and control measures necessary to conduct the work safely. Each JHA must be reviewed by the work team immediately prior to conducting the work. The JHA can be a source of information for the daily safety meeting. Project-specific JHAs are provided in Attachment 2.

2.1.3 Safety Meetings

CH2M HILL requires that the safety coordinator conduct daily safety meetings to discuss with the field team the task to be performed that day and the potential hazards and mitigation measure. The safety meeting can be used to review the JHA with the team. A Daily Tailgate Safety Briefing Form is included in Attachment 3.

A Pre-Task Safety Plan (PTSP) must be developed each day prior to performing specific work tasks. Each member of the team performing the task must be included in the planning so all are aware of the task hazards and controls. A copy of a PTSP is included in Attachment 4.

2.1.4 Self-Assessments

Project Activity Self-Assessment Checklists are contained in Attachment 5. These checklists provide a method of verifying compliance with established safe work practices, regulations,

and industry standards pertaining to hazardous activities. The checklists can be used by any CH2M HILL employee who may be exposed to a hazardous activity or by the SC when providing oversight of a subcontractor performing a hazardous activity. Self-assessments shall be completed prior to subjecting CH2M HILL staff to hazardous operations for any reason.

Self-assessment checklists should be completed every week during excavation activities.

If hazardous conditions exist or are apparent during the self-assessment, immediately notify the employees in the area and do not continue work in that area until the conditions are safe. If an imminent danger situation (immediately life threatening or would cause serious injury) exists, immediately stop work, warn all personnel in danger and notify the appropriate safety representative and the CH2M HILL SC. Non-compliance issues identified during the self-assessment shall be immediately rectified. If corrective action assistance is required, the HSM should be contacted for guidance.

Any site-specific requirements outlined in this HS&E Plan that are more stringent than those contained in the self-assessment checklists are to take precedence. The self-assessment checklists are based upon minimum regulatory compliance and some site-specific requirements may be more stringent. The self-assessment checklists, including documented corrective actions, shall be made part of the permanent project records and maintained by the SC.

2.1.5 Site Compliance/Audits

In order to ensure compliance with requirements contained in the Honeywell Remediation and Environmental Services (RES) Health and Safety Manual, Specification 01620, and with this HS&E Plan, audits will be conducted by a HS&E professional as follows: a minimum of once during project activities.

2.1.6 Interventions

Honeywell requires that we intervene whenever we see someone exhibiting an unsafe behavior or working in unsafe conditions. When such a situation is observed, an intervention is performed by talking to the person about how the task could be done more safely. Safe Work Observation forms must be completed on a weekly basis, at a minimum, by the SC or FTL. Each completed form must be maintained with the HS&E Plan field documents, and then transferred to project files upon the completion of the field work. A copy of a Safe Work Observation form is included in Attachment 6.

2.2 Project-Specific Hazards and Controls

The following sections describe potential hazards and control measures that may be encountered during site activities.

2.2.1 Respiratory Protection

The use of respiratory protection is not anticipated during this project. However, if site conditions warrant, the following requirements for respiratory protection will include:

- Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for air-purifying respirators (APR) use and Level B training is required for supplied-air respirators (SAR) and self-contained breathing apparatus (SCBA) use. Specific training is required for the use of powered air-purifying respirators (PAPR).
- Respirator users must complete the respirator medical monitoring protocol and been approved for the specific type of respirator to be used.
- Tight-fitting face piece respirator (negative or positive pressure) users must have passed an appropriate fit test within past 12 months.
- Respirator use shall be limited to those activities identified in this plan. If site conditions change, the HSM shall be notified to amend the respiratory protection requirements.
- Tight-fitting face piece respirator users shall be clean-shaven and shall perform a user seal check before each use.
- Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SC of any detection of vapor or gas breakthrough. The SC shall report any breakthrough events to the HSM.
- Respirators in regular use shall be inspected before each use and during cleaning
- Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition.
- Respirators shall be properly stored to protect against contamination and deformation.
- Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service.
- When breathing air is supplied by cylinder or compressor, the SC shall verify the air meets Grade D air specifications.
- The SC shall complete the H&S Self-Assessment Checklist – Respiratory Protection included in Attachment 5 of this plan to verify compliance with CH2M HILL's respiratory protection program.

Refer to CH2M HILL HSE SOP-121, Respiratory Protection, for additional information.

2.2.2 Exposure to Public Vehicular Traffic

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established by a contractor.

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.

- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route -- behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic – never assume drivers are looking out for you
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.
- When working on highway projects, obtain a copy of the contractor's traffic control plan.
- Work area should be protected by a physical barrier – such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion. All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

Refer to CH2M HILL HSE SOP-216, Traffic Control, for additional information.

2.2.3 Noise Hazards

Previous surveys indicate that heavy equipment such as drilling or excavation equipment may produce continuous and impact noise at or above the action level of 85 decibels (dBA).

All CH2M HILL personnel within 25 feet of operating equipment, or near an operation that creates noise levels high enough to impair conversation, shall wear hearing protective devices (either muffs or plugs). Personnel will wash their hands with soap and water prior to inserting ear plugs to avoid initiating ear infections.

Refer to CH2M HILL HSE SOP-108, Hearing Conservation Program, for additional information.

Refer to CH2M HILL HSE SOP-216, Traffic Control, for additional information.

2.2.4 Excavation

(Reference CH2M HILL SOP HS-32, Excavations)

Excavation depths expected during this project will be approximately 8 -12 inches below ground surface. If site conditions change and deeper excavations are conducted the following will apply.

- Do not enter the excavations unless completely necessary, and only after the competent person has completed the daily inspection and has authorized entry.
- Follow all excavation entry requirements established by the competent person.
- Do not enter excavations where protective systems are damaged or unstable.
- Do not enter excavations where objects or structures above the work location may become unstable and fall into the excavation.
- Do not enter excavations with the potential for a hazardous atmosphere until the air has been tested and found to be at safe levels.
- Do not enter excavations with accumulated water unless precautions have been taken to prevent excavation cave-in.
- H&S Self-Assessment Checklist – Excavations, found in Attachment 5 of this plan, should be used to evaluate excavations prior to entry.

2.2.5 Earthmoving Equipment

Reference CH2M HILL SOP HSE-306, *Earthmoving Equipment*)

- Only authorized personnel are permitted to operate earthmoving equipment.
- Maintain safe distance from operating equipment and stay alert of equipment movement. Avoid positioning between fixed objects and operating equipment and equipment pinch points, remain outside of the equipment swing and turning radius. Pay attention to backup alarms, but not rely on them for protection. Never turn your back on operating equipment.
- Approach operating equipment only after receiving the operator's attention. The operator shall acknowledge your presence and stop movement of the equipment. Caution shall be used when standing next to idle equipment; when equipment is placed in gear it can lurch forward or backward. Never approach operating equipment from the side or rear where the operator's vision is compromised.

- When required to work in proximity to operating equipment, wear high-visibility vests to increase visibility to equipment operators. For work performed after daylight hours, vests shall be made of reflective material or include a reflective stripe or panel.
- Do not ride on earthmoving equipment unless it is specifically designed to accommodate passengers. Only ride in seats that are provided for transportation and that are equipped with seat belts.
- Stay as clear as possible of all hoisting operations. Loads shall not be hoisted overhead of personnel.
- Earthmoving equipment shall not be used to lift or lower personnel.
- If equipment becomes electrically energized, personnel shall be instructed not to touch any part of the equipment or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party shall be contacted to have line de-energized prior to approaching the equipment.

2.3 General Hazards and Controls

2.3.1 General Practices and Housekeeping

General "good housekeeping" practices include:

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness requires enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

Refer to CH2M HILL HSE SOP-209, General Practices, for additional information.

2.3.2 Hazard Communication

The SC is to perform the following:

- Complete an inventory of chemicals brought to the site by CH2M HILL using Attachment 7.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Copies of all applicable MSDSs will be placed in Attachment 8.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific hazard communication training using Attachment 9.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

Refer to CH2M HILL HSE SOP-107, Hazard Communication, for additional information.

2.3.3 Shipping and Transportation of Chemical Products

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

Refer to CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods for additional information.

2.3.4 Lifting

Proper lifting techniques must be used when lifting any object:

- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift – especially for heavy or awkward loads.
- Make sure the path of travel is clear prior to the lift.

Refer to CH2M HILL HSE SOP-112, Lifting, for additional information.

2.3.5 Fire Prevention

Fire prevention measures include the following:

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

Refer to CH2M HILL HSE SOP-208, Fire Prevention, for additional information.

2.3.6 Electrical

Electrical safety measures include:

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- Extension cords must be:
  - equipped with third-wire grounding.
  - covered, elevated, or protected from damage when passing through work areas.

  - protected from pinching if routed through doorways.
  - not fastened with staples, hung from nails, or suspended with wire.

- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

Refer to CH2M HILL HSE SOP-206, Electrical, for additional information.

2.3.7 Stairways and Ladders

Safety guidelines pertaining to stairways and ladders include the following:

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails
- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement

- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders ≥ 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

Refer to CH2M HILL HSE SOP-214, Stairways and Ladders, for additional information.

2.3.8 Heat Stress

Prevention measures to avoid heat stress include:

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°F to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.

- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SC to avoid progression of heat-related illness.

Symptoms and treatment of heat stress are summarized in Table 2-1.

TABLE 2-1
Symptoms and Treatment of Heat Stress

Type of Heat Stress	Signs and Symptoms	Treatment
Heat Syncope	Sluggishness or fainting while standing erect or immobile in heat.	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.
Heat Rash	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.
Heat Cramps	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Remove to cooler area. Rest lying down. Increase fluid intake.
Heat Exhaustion	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.
Heat Stroke	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.	Cool rapidly by soaking in cool–but not cold–water. Call ambulance, and get medical attention immediately!

Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress.

- The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
- The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse.
- If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent.
- The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

Refer to CH2M HILL HSE SOP-211, Heat and Cold Stress, for additional information.

2.3.9 Compressed Gas Cylinders

Safety measures pertaining to handling compressed gas cylinders include:

- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

2.3.10 Procedures for Locating Buried Utilities

Local Utility Mark-Out Service: Contact MISS UTILITIES prior to conducting any subsurface work activities.

Name:	MISS UTILITIES
Phone:	800-257-7777

Procedures for locating buried utilities include:

- Contact your local utility location service.
- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change n advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

2.3.11 Confined Space Entry

No confined space entry will be permitted. Confined space entry is not anticipated to occur during this project. However, if site conditions change the following will apply. Confined space entry requires additional health and safety procedures, training, and a permit. If conditions change such that confined-space entry is necessary, contact the HSM to develop the required entry permit.

When planned activities will not include confined-space entry, permit-required confined spaces accessible to CH2M HILL personnel are to be identified before the task begins. The SSC is to confirm that permit spaces are properly posted or that employees are informed of their locations and hazards.

Refer to CH2M HILL SOP HS-203, Confined Space Entry, for additional information.

2.3.12 Backing Field Vehicles

The following precautions shall be implemented to prevent incidents during backing of field vehicles:

- Avoid backing whenever possible. The SC will be responsible for determining when "backing" is allowed. If extensive backing is required, alarms that sense when an object is close by must be used.
- If backing is required, there MUST BE a spotter. If a spotter is not available, the driver MUST walk completely around the vehicle before backing up.
- When "backing" is likely to be a part of the activities, it must be discussed in the daily safety briefings to remind staff of the hazards and controls.
- Learn your vehicle's blind spots.

2.3.13 Severe Weather

The following precautions should be taken in the event of severe weather:

- Identify "Take Shelter" areas before starting project.
  - If it is necessary to seek shelter, notify the Project Manager and Client Representative.
- Work may proceed in light rain, although workers should wear rain gear.
- Exposure to slips, trips and falls is increased during rainy and snowing conditions.
- Take cover in field vehicle during adverse weather conditions (e.g., high winds, heavy rain, or lightning).
- Work shall cease and cover sought in the event of lightning or tornado warnings.
- In the event of excessive rainfall, excavations will be covered, bermed, and secured with an impervious liner and either sandbags or stone.

2.3.14 Resident Protection

At a minimum the following shall apply:

- Work zones shall be clearly defined by orange construction fencing during remedial field activities – site residents will be requested to not enter work zones during active remedial field activities. When residents are walking, standing or near work zones, the Safety Coordinator (SC) or designee, shall inform residents of potential site hazards and recommend they stand clear to minimize potential hazards associated with the on-going, nearby work activities.
- Water suppression will be used during excavation and soil removal activities to minimize dusty conditions.
- Dust monitoring will be performed daily during field activities to monitor the dust levels within the working areas. Action levels have been prescribed to provide for appropriate levels of protection for workers and residents. See section 5.0 for specific details regarding dust monitoring.
- Workers inside the work zones shall wear personal protective equipment as prescribed in Section 4.0. Safety to residents is of the utmost importance. Contact with contaminated materials presents the most significant exposure risks to residents. Decontamination materials will be available for residential use, as requested, if inadvertent contact is made with potentially contaminated materials, such as dust residue from sidewalks.

The SC shall continuously assess the working area to determine if additional safety measures are appropriate based upon actual site conditions.

2.4 Biological Hazards and Controls

2.4.1 Snakes

Each year, about 9,000 people are bitten by poisonous snakes in the U.S. Only about 15-25% actually receive venom, and U.S. deaths from snakebites only total about 12-15 people annually. In 2002, there were only 9 snakebite deaths in the US. Most snakebite deaths occur in small, young children whose lack of body mass and immune system development make them more susceptible to snake venom. However, a far larger number of people suffer medical complications ranging from mild to serious problems from improper treatment than the number who die. Therefore, knowing what to do to avoid snakebites, and how to properly treat them if they occur, is critical to preventing permanent injury or death.

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical

attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

Table 2-3 summarizes the measures to be taken (and NOT to be taken) in the event of a snakebite.

TABLE 2-3
Snakebite Response Measures

Things to Do	Things NOT to Do
• Move victim, and everybody else, away from snakes.	• Do not cut and suck the wound, either manually or orally.
• Identify the snake - kill it ONLY if necessary.	• Do not apply a tight, narrow band tourniquet - these cause amputations!
• Lie the victim down with the bite area at or just slightly below the heart level.	• Do not apply ice or heat packs, and do not use a stun gun on the bite area.
• Calm the victim by explaining the facts about snakebites.	• Do not give the victim any food or drink, and this applies especially to alcohol!
• Immobilize the bite area with a splint and sling, if possible.	• Do not allow the victim to become alarmed, excited or agitated, as this will only increase blood flow and the chances of getting poison to the heart.
• Remove constricting jewelry or clothing unless the victim resists.	• Do not allow victim to exercise vigorously, including running.
• Get professional medical help as quickly as possible.	• If you must kill the snake, then do NOT touch its head for at least one hour. If you must kill a snake for identification purposes, then completely remove its head and bury it. Snake heads have been documented as capable of biting and injecting poison an hour or more after decapitation.
	• Do not waste valuable time on unimportant acts like trying to find a snake to identify or kill it. Hemotoxic poison will start to enter the blood stream within 30 minutes, and neurotoxin poison works even faster.

Following the above protocols (Table 2-3) will greatly reduce the chances of serious complications from snakebites. Bear in mind that few people die from poisonous snakebites and the vast majority of snakebite victims are not even venomized. Snakes generally reserve their venom for prey they intend to eat. Snakebites are more a nuisance than a serious medical problem in most cases.

2.4.2 Poison Ivy and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become

familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention. Additional information and photographs of each are provided in Attachment 10.

2.4.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Symptoms of tick-borne diseases include chills, fever, headache, fatigue, stiff neck, and bone pain. Other symptoms include:

- Lyme Disease - A rash might appear that looks like a bullseye with a small welt in the center.
- Rocky Mountain Spotted Fever – A rash of red spots may appear under the skin 3-10 days after the tick bite.

If any of these symptoms appear, seek medical attention.

2.4.4 Bees and Other Stinging Insects

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SSC and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

2.4.5 Bloodborne Pathogens

Exposure to bloodborne pathogens may occur when rendering first aid or cardiopulmonary resuscitation (CPR), or when coming into contact with landfill waste or waste streams containing potentially infectious material. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

Refer to CH2M HILL HSE SOP-202, Bloodborne Pathogens, for additional information regarding exposure controls and PPE.

2.4.6 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southeastern United States it is recommended that preventative measures be taken to reduce the probability of being bitten

by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent.

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

Symptoms of Exposure to the West Nile Virus

The West Nile Virus incubation period is from 3-15 days. Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

If you have any questions or to report any suspicious symptoms, contact the project HSM.

2.4.7 Spiders

Black Widow

Description

The female black widow spider is almost twice the size of its male counterpart. Although both are considered venomous, only the female spider is able to bite and envenomate humans. During the summer months, the female black widow spider is the most venomous. The spider undergoes multiple moltings throughout the year and often changes color. The female is most often shiny black in color and has a rounded abdomen with a red distinctive hourglass on its ventral surface. Occasionally, two red spots may be seen instead of the hourglass configuration.

Symptoms

When bitten by a black widow spider, the symptoms usually begin with a pinprick sensation, followed by the appearance of mild swelling and redness around the bite wound. It is not unusual for the patient to be unaware of the bite until a local reaction has occurred. Close evaluation of the site may reveal two fang marks. The first hour after the bite, pain

often increases around the area of the bite and spreads to the entire body. Upper extremity bites usually lead to spasm of the upper trunk muscles; bites of the lower extremity often lead to abdominal spasms.

Other common symptoms include an abnormal sensation in the extremities (i.e., prickling or burning), deep tendon reflexes, headache, anxiety, nausea, vomiting, tremor, restlessness, and seizures may also be seen. Symptoms usually resolve within 24-48 hours

General treatment includes local wound care, a tetanus shot, and pain medication if needed. Airway, breathing, and circulation should be monitored closely.

Prevention

Wear gloves, heavy garments that are fully buttoned, and protective footwear when working in areas where spiders commonly inhabit (i.e., dark and protected spaces such as wells, rock and wood piles, pipes, gloves, boots, etc.)

Brown Recluse

Description

The brown recluse spider is approximately 1 centimeters (cm) in body length, with a leg span of up to 2.5 cm. The color of these spiders is usually tan to brown.

Symptoms

Envenomation is initially painless for most victims. Within the first few hours, pain and redness occur at the site of the bite. The bite mark may resemble a bullseye and is most often 1-5 cm in diameter. Over the next few days, the bite area will ulcerate and spread in diameter and into the fatty tissue below. In one week after the bite a large area of skin and tissue can be involved. Surgical intervention is usually required to remove the bite area.

Systemic reactions, while uncommon, can occur in some individuals. These symptoms usually occur within 2 days of the bite and can include fever, chills, rash, nausea, vomiting, and possible renal failure.

General treatment includes local wound care, tetanus inoculation, immobilization, elevation, observation, and surgical removal of the wound.

Prevention

Wear gloves, heavy garments that are fully buttoned, and protective footwear when working in areas where spiders commonly inhabit (i.e., dark and protected spaces such as wells, rock and wood piles, pipes, gloves, boots, etc.)

Additional information regarding spiders can be found in Attachment 10.

2.5 Chemicals of Potential Concern

Table 2-4 summarizes information pertaining to chemicals of potential concern (COPCs) at the project site.

TABLE 2-4
Chemicals of Potential Concern Summary Table

Contaminant [a]	Impacted Media [b]	Maximum Conc(s) [c]	Exposure Limit [d]	IDLH [e]	Symptoms and Effects of Exposure	PIP [f] (eV)
Arsenic	SB	177 ppm	0.01 mg/m^3	5 mg/m^3	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	N/A
Chromium As Cr II or Cr III	SB	51 ppm	0.5 mg/m^3	25 mg/m^3	Irritated eyes, sensitization dermatitis, histologic fibrosis of lungs	N/A
Vanadium	SB	37 ppm				
Lead	SB	820 ppm	0.05 mg/m^3	100 mg/m^3	Lassitude, facial pallor, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	N/A

Notes:

[a] "Ca" = potential occupational carcinogen.

[b] Specify all impacted media to which site workers may be exposed using the following definitions:

A (Air)	SB (Soil)	SW (Surface Water)
D (Drums)	SL (Sludge)	TK (Tank)
GW (Groundwater)	SV (Soil Vapor)	

[c] The maximum concentrations detected at the site for each media of concern.

[d] The lower of the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) is listed. Values are given in parts per million (ppm) or milligrams per cubic meter (mg/m^3).

[e] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); ND = Not determined.

[f] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

Workers may also be exposed to chemicals used during sampling and remediation activities. MSDSs are required for all virgin (i.e., non-contaminant) chemicals brought to the site. These MSDSs are presented as Attachment 8.

A summary of the personal protective equipment required to minimize exposure to environmental contaminants and virgin chemicals is presented in Section 4.

2.6 Potential Routes of Exposure

Potential routes of exposure include the following:

- **Dermal:** Skin contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Personal Protective Equipment Section of this plan.
- **Inhalation:** Inhalation of vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in the PPE and Air Monitoring/Sampling Sections of this plan, respectively.
- **Ingestion:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

- Provide adequate oversight of subcontractor HS&E practices per the HS&E Plan.

3.1.2 Project Health and Safety Manager

The CH2M HILL Project Health and Safety manager (HSM) is responsible to:

- Support the SC's oversight of HS&E practices and interfaces with onsite third parties per the HS&E Plan.
- Conduct audits, as necessary, to assess site conditions and review HS&E program implementation.
- Assist the PM with HS&E budget guidelines.
- Assist with program implementation as needed.

The HSM has the following additional responsibilities when subcontractors are hired:

- Ensure that subcontractor pre-qualification questionnaires are reviewed and assist as applicable in the acceptance or rejection.
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations.
- Support the SC's oversight of subcontractor's (and lower-tier subcontractor's) HS&E practices per the HS&E Plan.

3.1.3 Safety Coordinator

The Safety Coordinator (SC) shall be onsite for the duration of onsite work and is responsible for verifying that the project is conducted in a safe manner including the following obligations:

- Verify that this HS&E Plan is current and amended when project activities or conditions change.
- Verify that CH2M HILL site personnel and subcontractors read this HS&E Plan and sign the CH2M HILL Employee Sign-Off Form included in Attachment 1.
- Verify compliance with the requirements of this HS&E Plan, applicable contractor health and safety plan(s) and any federal, state, and local regulations.
- Review and understand contractual obligations regarding HS&E roles and responsibilities.
- Manage the site and interfacing with third parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care.
- Ensure that programs are effectively functioning to prevent and control hazards on the project.
- Verify that all CH2M HILL employees working in the field have the appropriate level of HS&E training, medical surveillance, and drug and alcohol testing for their job duties

including required specialty training (e.g., fall protection, confined space entry) identified in the Hazard Controls and Safe Work Practices Section of this HS&E Plan.

- Conduct an HS&E orientation for all CH2M HILL team members prior to entering the project work areas and deliver field HS&E training as needed based on project-specific hazards and activities.
- Maintain active and visible involvement using open communication with employees regarding safety issues on the project.
- Verify that safety meetings are conducted and document in the project file as needed throughout the course of the project (e.g., as tasks or hazards change).
- Attend Contractor safety meetings and ask questions about access to work areas, safety hazards, precautions and other general safety issues.
- Post required information onsite. An Occupational Safety and Health Administration (OSHA) job-site poster is required at sites where project field offices, trailers, or equipment-storage boxes are established. Contact the HSM for posters.
- Maintain HS&E records and documentation.
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in the Hazard Communication section of this HS&E Plan.
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in the Emergency Preparedness section of this HS&E Plan.
- Verify that project HS&E forms, permits and self-assessment checklists are being used as outlined in this plan.
- Ensure that the Drug Testing Hospital Kit is available onsite in the event of a serious injury involving hospital, ambulance, or paramedic care. The hospital kit must accompany the injured employee to the hospital so they will get drug tested. For additional information on the Drug Testing Hospital Kits, refer to Attachment 11.
- Verify appropriate PPE use, availability, and training.
- Inform the HSM of any project incident, ensure that an Incident Report Form (IRF) is completed and conduct incident investigations as outlined in the Incident Reporting and Investigation section of this HS&E Plan.
- Facilitate OSHA or other government agency inspections including accompanying inspector and providing all necessary documentation and follow-up.
- Report all incidents to the HSM and/or the Honeywell HSPM immediately. Depending on the type and severity of incident, we may have to report it to Honeywell within hours of occurrence. The Honeywell HSPM will determine what needs to be reported, the timing of the reporting, and coordinate client notification so local and Corporate Honeywell personnel are appropriately notified.

The SC has the following additional responsibilities when subcontractors are hired:

- Verify that project files available to site personnel include copies of executed contracts and certificates of insurance; bond; contractors license; training, medical monitoring, and drug and alcohol testing records; and project-specific HS&E procedures prior to start of subcontractor's field operations.
- Verify that ongoing training, medical monitoring, and drug and alcohol testing requirements are being met (e.g., 8-hour refresher, random drug testing programs, etc).
- Perform oversight and/or assessments of subcontractor HS&E practices per this HS&E plan and verify that project activity self-assessment checklists have been completed (Attachment 5).

3.1.4 CH2M HILL Employees

All personnel are assigned responsibility for safe and healthy operations. This concept is the foundation for involving all employees in identifying hazards and providing solutions. For any operation, individuals have full authority to stop work and initiate immediate corrective action or control. In addition, each worker has a right and responsibility to report unsafe conditions/practices. This right represents a significant facet of worker empowerment and program ownership. Through shared values and a belief that all accidents are preventable, our employees accept personal responsibility for working safely. Each employee is responsible for the following:

- Perform work in a safe manner without injury, illness or property damage.
- Perform work in accordance with company policies, and report near misses, injuries, illnesses, and unsafe conditions.
- Report all incidents, include near misses, immediately to supervisor, and file proper forms with a human resources representative. Contact your HS&E Manager and the Honeywell HSPM to ensure client reporting procedures are met. It is important to do incident notification immediately because, depending on the type of incident, we may be required to report to Honeywell within hours of the event.
- Report all hazardous conditions and/or hazardous activities immediately to a supervisor for corrective action.
- Intervene when an unsafe behavior and/or condition is observed.
- Complete an HS&E orientation prior to being authorized to enter the project work areas.
- Inspect assigned PPE to ensure the absence of defects and proper function.

3.2 CH2M HILL Employee Medical Surveillance, Training, & Drug Testing

Employees assigned to this project will have the following minimum training.

- 40-hour hazardous waste operations training

- 3-day on-the-job experience
- 8-hour annual hazardous waste refresher training.
- Employees who are in an onsite supervisor role will complete 8 hours of hazardous waste supervisor training
- Drug-Free Workplace training (when drug testing is required)
- Honeywell Program orientation
- Site-specific training/orientation

Employees designated as SC will also have completed a 12-hour safety coordinator course. The safety coordinator training course meets the requirements of 29 CFR 1910.120 for on-site supervisor training. An SC must be present during all tasks performed in exclusion or decontamination zones.

The SC and additional designated employees, as necessary, will be certified in first aid and CPR by the American Red Cross, or equivalent. At least one first aid/CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training. Additional training requirements are addressed in the specific hazard sections of this plan.

Employees who perform work activities in the decontamination or exclusion zone shall be enrolled in and have a current medical clearance as required by the medical surveillance program for hazardous waste workers.

Pregnant employees shall consult with the Corporate Consulting Physician prior to performing site activities and obtain a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Drug testing is required for CH2M HILL employees who engage in certain activities at Honeywell sites (e.g., activities involving heavy equipment or drill rigs). Employees who conduct fieldwork may be required to pass an initial 5-panel drug screen and an alcohol screen two weeks prior to starting field activities. These staff will also be required to enroll in a random testing program for the duration of their work on Honeywell, and will be subject to post-incident and "for cause" testing. Contact the HSM to determine if drug testing is required. If site conditions change and/or additional tasks are added, contact the HSM to determine drug and alcohol testing requirements.

Based on specific work activities/tasks, subcontractor personnel may be required to be drug and alcohol screened prior to conducting their field activities. Please contact the Health and Safety Program Manager (HSPM) for details and to determine if subcontractor personnel require drug testing.

Refer to CH2M HILL HSE SOP-113, Medical Surveillance, SOP-110, Training, and SOP-105, Drug-Free Workplace, for additional information.

3.3 CH2M HILL Subcontractors

The table(s) below lists the name of each subcontractor, the subcontractor safety representative, and a description of the subcontracted activities to be performed at the site.

Subcontractor	Environmental Waste Minimization, INC
Subcontractor Safety Rep	Dave Powat - 484-357-3123
Subcontractor Onsite Tasks	Concrete removal, soil excavation and site restoration

- If additional subcontractors are added complete the following table.

Subcontractor	TBD
Subcontractor Safety Rep	
Subcontractor Onsite Tasks	

The subcontractors listed above are covered by this HS&E Plan and must be provided a copy of this document. However, this plan does not address hazards associated with the tasks and equipment for which the subcontractors have been engaged (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work. Subcontractors must comply with all established health and safety plan(s) for this project. The CH2M HILL SC should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established HS&E Plan(s). CH2M HILL's oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL team members should endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observation of hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. The SC is responsible for confirming subcontractor performance against both the subcontractor's task specific safety procedures and applicable self-assessment checklists, as provided in Attachment 5.

HS&E related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the CH2M HILL HS&E Plan Employee Sign-Off Form, included in Attachment 1.
- Request subcontractor(s) to brief project team on the hazards and precautions related to their work.

- When non-compliant or unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action — the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat non-compliant or unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected personnel, notify subcontractor safety representative, stop affected work until adequate corrective measures are implemented, and notify the Project Manager, HSM, and SC as appropriate.
- Document all verbal HS&E related communications in project field logbook, daily reports, or other records.

Subcontractors are responsible to:

- Comply with all local, state, and federal HS&E standards; and project/owner HS&E requirements.
- Provide a qualified subcontractor safety representative (SSR) to oversee the subcontractor activities and conduct safety inspections for their work.
- Conduct site-specific orientations for all subcontractor employees.
- Actively participate in the project HS&E program and attend all required safety meetings.
- Meet training, medical monitoring, and drug and alcohol testing requirements for their staff.
- Intervene when they observe unsafe behaviors and/or conditions.
- Maintain equipment and supplies necessary to complete activities in a safe manner.
- Notify the CH2M HILL SC of any injury or incident, including near-misses, immediately and submit reports to CH2M HILL within 24 hours. Additionally, all incidents must be reported to the HSM and Honeywell HSPM immediately so we can meet Honeywell's incident reporting requirements.

Refer to CH2M HILL HSE SOP-215, Contracts, Subcontracts, and HSE Management Practices, for additional information.

3.4 Third Parties

The table(s) below list the name of each third party, the third party safety representative, and a description of the third party activities being performed at the site which have the potential to impact CH2M HILL's activities.

4.0 Personal Protective Equipment

The PPE hazard assessment performed by the HSM requires the following PPE for use during site activities. The PPE required by the table will be evaluated periodically by the SC to ensure the adequacy based on air monitoring results or changes to expected site conditions. The SC shall coordinate all changes with the HSM.

Refer to CH2M HILL HSE SOP-117, Personal Protective Equipment, and SOP-121, Respiratory Protection, for additional information.

4.1 PPE Specifications

PPE requirements for the project are summarized in Table 4-1.

TABLE 4-1
PPE Specifications [a]

Task	Level	Body	Head	Respirator [b]
All site tasks except those listed in Modified D	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat [c] Safety glasses Ear protection [d] Traffic Vest	None required
Contaminated soil excavation or exposure; confirmatory soil sampling;	Modified D	Coveralls: Uncoated coverall when working within exclusion zone Boots: Steel-toe work boots - outer boot covers when working within exclusion zones Gloves: Inner surgical-style nitrile & outer work leather gloves.	Hardhat [c] Splash shield [c] Traffic vest Safety glasses Ear protection [d]	None required
Contaminated soil excavation – not anticipated – contact HSM for additional requirements	C	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Ear protection [d] Spectacle inserts	APR, full face, with P100/organic vapor combo cartridges.
Note anticipated or authorized	B	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Ear protection [d] Spectacle inserts	Pressure demand supplied air respirator with escape bottle or Pressure demand SCBA

Notes:
[a] CH2M HILL will provide PPE only to CH2M HILL employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to be determined by the SC.
[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.
[e] Cartridge change-out schedule will be established by the HSM and at a minimum shall be at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)—then at least every 4 hours. If encountered conditions are different than those anticipated in this HS&E Plan, contact the HSM.

4.2 Reasons for Changing Level of Protection

Reasons for upgrading or downgrading the level of PPE are provided below.

4.2.1 Upgrade

Potential reasons for upgrading PPE level are listed below. ***Note: Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SC qualified at that level is present.***

- Request from individual performing tasks.
- Change in work tasks that will increase contact or potential contact with hazardous materials.
- Occurrence or likely occurrence of gas or vapor emission.
- Known or suspected presence of dermal hazards.
- Instrument action levels (Section 5) exceeded.

4.2.2 Downgrade

Potential reasons for downgrading PPE level are listed below.

- New information indicating that situation is less hazardous than originally thought.
- Change in site conditions that decrease the hazard.
- Change in work task that will reduce contact with hazardous materials.

5.0 Air Monitoring/Sampling

Air monitoring and sampling must be performed to verify that our employees are not be exposed to harmful levels of airborne contaminants and that airborne contaminants are not migrating into public areas. Refer to CH2M HILL SOP HSE-207, *Exposure Assessment for Airborne Chemical Hazards*, for additional information

5.1 Air Monitoring Specifications

Air monitoring specifications are summarized in Table 5-1.

Table 5-1

Instrument	Tasks	Action Levels[a]		Frequency [b]	Calibration
Dust Monitor: Miniram model PDM-3 or equivalent	Excavation	0 -1 mg/m^3 > 1 mg/m^3	Level D Level C	Continuously throughout remedial excavation activities	Zero Daily
Noise-Level : Auditory	All	Conversations can be held at distances of 3 feet without shouting Conversations cannot be held at a distances of 3 feet without shouting	No action required Hearing protection required	Initially and periodically during task	NA

[a] Action levels apply to sustained (3 minutes or longer) breathing-zone measurements above background.
[b] The exact frequency of monitoring depends on field conditions and is to be determined by the SC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3," "at surface/SB-2," etc.).
[c] Noise monitoring shall be used at the discretion of the SC.

5.2 Calibration

Instruments will be function tested in accordance with the respective manufacturer's instructions for proper instrument use and maintenance. The instrument vendor or the CH2M HILL warehouse staff will ensure equipment has been calibrated in accordance with manufacturer's specifications.

All direct reading instruments will be function tested daily by the SC using span gas, prior to performing work activities and after the completion of the daily activities.

5.3 Air Sampling

Personal air sampling will not be conducted during this project. However, if site conditions change and personal air sampling is required, the following shall apply. Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, beryllium, hexavalent chromium, benzene, methylene chloride, vinyl chloride and certain volatile organic compounds. Air sampling methods will be National Institute for Occupational Safety and Health (NIOSH) or OSHA-certified and samples analyzed by a laboratory that is accredited by the American Industrial Hygiene Association (AIHA) for the compound specific method.

Real time dust monitoring will be performed using a MIE DataRAM 4000 dust monitors, or equivalent, throughout the duration of field activities. Each day, a DataRAM will be placed in a downwind and upwind location at the discretion of the SC. The CH2M HILL Safety Coordinator, or designee, will record the DataRAM periodically, along with a brief description of the activity taking place. Additionally, the DataRAM results will be downloaded each day so that the fluctuations in total dust concentrations can be observed

6.0 Decontamination

The SC must establish the specific decontamination procedures for the specific site tasks. The SC must monitor the decontamination procedures, and should modify any procedures found to be ineffective. The SC must ensure that procedures are established for disposing of materials generated on the site.

Refer to CH2M HILL HSE SOP-506, Decontamination, for additional information.

6.1 Decontamination Requirements

Possible decontamination procedures are provided in Section 6.1.

TABLE 6-1
Possible Decontamination Procedures

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse • Glove wash/rinse • Outer-glove removal • Body-suit removal • Inner-glove removal • Respirator removal • Hand wash/rinse • Face wash/rinse • Shower • Disposal of PPE in municipal trash, or containment for disposal • Disposal of personnel rinse water to facility or sanitary sewer, or containment for offsite disposal	• Wash/rinse equipment • Solvent-rinse equipment • Contain solvent waste for offsite disposal	• Power wash • Steam clean • Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

6.2 Diagram of Personnel Decontamination Line

Figure 6-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SC to accommodate task-specific requirements. No eating, drinking, or smoking is permitted in contaminated areas or in exclusion and decontamination zones. The SC should establish areas for these activities.

6.3 Collection and Disposal of Decontamination Wastes

Contaminated materials, PPE, and fluids shall be managed according to waste management procedures specified in the project Work Plan. If no such guidance is available, please contact the ECC for additional information and procedures.

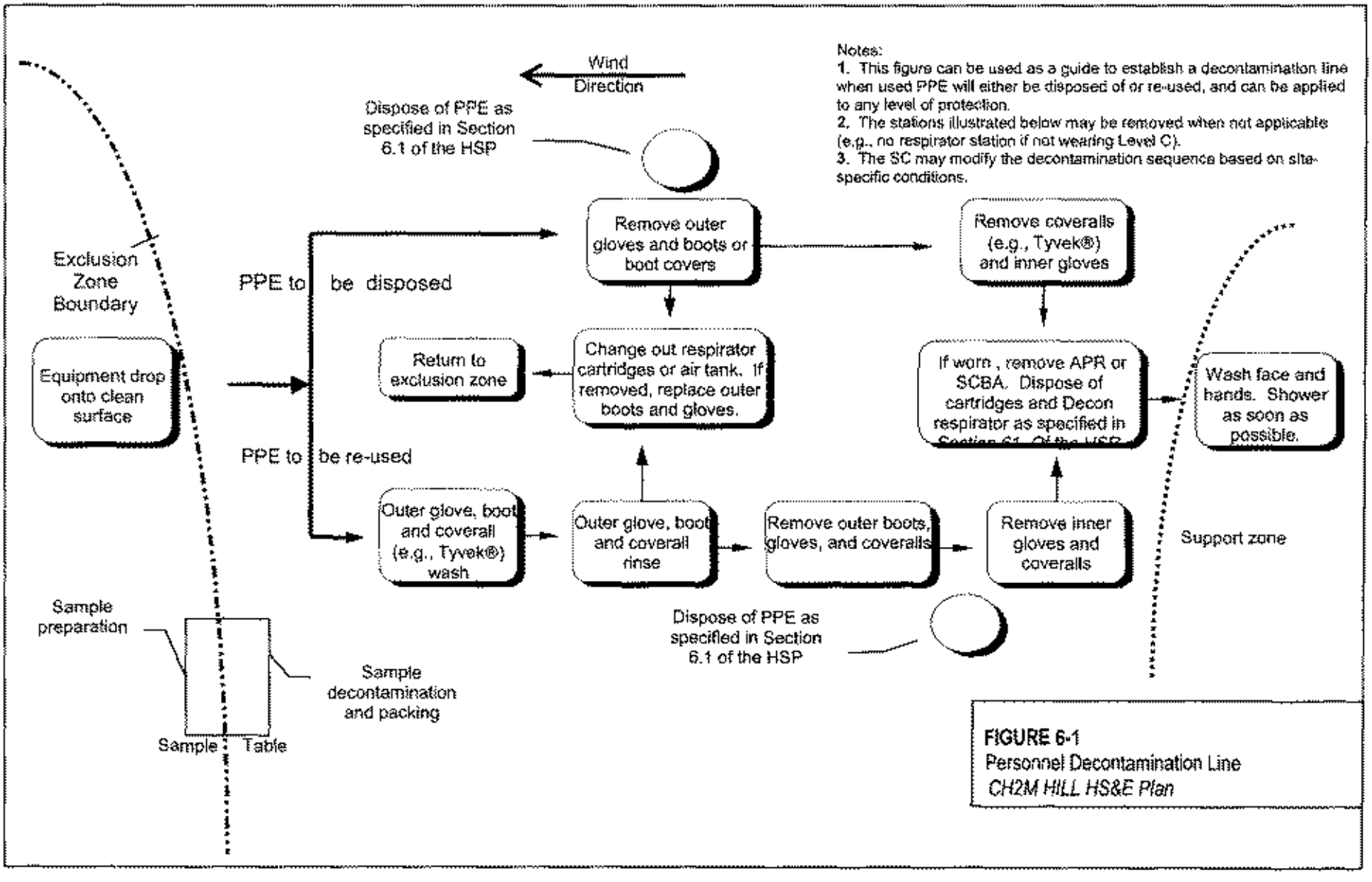

FIGURE 6-1
Personnel Decontamination Line
CH2M HILL HS&E Plan

7.0 Spill Containment and Notification

This section describes spill containment and notification requirements.

7.1 SPCC Regulated Facility

If the client facility is subject to a Spill Prevention, Control and Countermeasures (SPCC) Plan, a copy must be obtained and all spill prevention and response must conform to client SPCC requirements. If the client does not have an SPCC Plan and the project requires storage of more than 1,320 gallons of petroleum in 55-gallon containers or greater, a project-specific SPCC plan will be prepared.

7.2 Non-SPCC Regulated Facility

Projects not subject to SPCC requirements shall comply with this section. All onsite personnel shall be trained to follow the procedures described in this section.

7.2.1 Equipment

Field staff should obtain client approval for use of client-owned spill containment equipment. If client equipment is not available, the minimum spill equipment that shall be made available in the project's support zone is described in Table 7-1. Additional contaminant-specific spill response information may be included in the chemical MSDS.

TABLE 7-1
Minimum Spill Kit Equipment List

Spill Kit Contents
• Absorbent material (kitty litter or vermiculite)
• Neutralizers (for chemical spills)
• Sodium Carbonate (acid spills)
• Citric Acid (base spills)
• Absorbent socks and pads
• Safety Goggles
• Protective Gloves
• Tyvek Suit
• Waste Containers and Labels

7.2.2 Emergency Spill Event

The release of an unknown hazardous material is considered an emergency spill event. Implement the following procedures during an emergency spill event:

1. Evacuate the area and go upwind
2. Warn others and direct them upwind
3. Immediately contact the onsite Safety Coordinator who will contact the HSM for direction

7.2.3 Non-Emergency Spill Event

A non-emergency spill event includes incidental releases that do not pose a significant safety or health hazard where chemical hazards are known and CH2M HILL personnel can safely implement the following procedures as a first responder:

1. Stop the source of the spill
2. Contain the spill material. If there is a chance the spill will reach nearby drains or waterways, block them off to keep the spill away
3. Contact the onsite Safety Coordinator

7.2.4 Cleanup

Clean up the spilled material wearing the proper PPE identified in the HS&E Plan equipment table if the spilled material is less than 5 gallons and hazards are known. Spills larger than 5 gallons must be cleaned up by a qualified subcontractor since CH2M HILL personnel are not trained to implement OSHA spill response requirements. Dispose of spill debris according to the Waste Management Plan or as directed by the ECC.

7.2.5 Notification and Reporting

All spills are considered an "incident" and shall be reported internally according to procedures in HSE SOP-111, Incident Reporting and Investigation. Since many spills may require agency reporting within 24 hours, it is very important that internal notification occur immediately. The following summarizes required actions:

1. ***Immediately*** notify the onsite Safety Coordinator
2. SC notifies the HSM
3. HSM notifies the PM, who notifies the client
4. HSM notifies the Legal Department of a serious incident
5. HSM, ECC, and client shall determine if the incident is reportable to an agency

8.0 Site-Control Procedures

The following site control procedures shall be implemented at the site:

- The SC will conduct a site safety briefing before starting field activities or as tasks and site conditions change.
- Topics for the site safety briefing include general discussion of the HS&E plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, and emergencies.
- The SC will record attendance at safety briefings in a logbook and document the topics discussed.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Initial air monitoring shall be conducted by the SC using an appropriate level of PPE.
- The SC is to conduct periodic inspections of work practices to determine the effectiveness of this plan. Deficiencies are to be noted, reported to the HSM, and corrected.

Refer to CH2M HILL HSE SOP-510, Site Control, for additional information.

9.0 Hazwoper Compliance Plan

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks (Section 1.3.1) might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 1.3.2 do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff are working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to subsections 2.5 and 5.3 for contaminant data and air sampling requirements, respectively.
- When non-Hazwoper-trained personnel are at risk of exposure, the SC must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - Nature of the existing contamination and its locations
  - Limitations of their access
  - Emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.

Refer to CH2M HILL HSE SOP-220, Site-Specific Written Safety Plans, for additional information.

10.0 Incident Reporting and Investigation

This section describes the notification and investigation requirements pertaining to a site incident. Refer to CH2M HILL HSE SOP-111, Incident Reporting and Investigation, for additional information.

10.1 Definitions

10.1.1 Incident

An incident is an undesired event that results or could have resulted in an injury, illness, damage to assets or environment harm. The following events shall be considered incidents:

- Injury or illness to a CH2M HILL employee or CH2M HILL subcontractor employee
- Injury or illness to a third party that was caused by a CH2M HILL activity
- Hazardous substance exposure
- Damage to property or equipment
- Motor vehicle accident
- Fire or explosion
- Spill or release
- Environmental issue permit violation
- A "near-miss"

10.1.2 Near-Miss

A near-miss occurs when an intervening factor prevented an injury, damage to property, or environmental harm from occurring. Examples of near-miss situations include: a hard hat or other PPE prevented an injury; secondary containment or emergency shutoff prevented a spill; or an alert co-worker prevented an accident. All near miss incidents and reports must be reported and sent to the HSM as soon as practical, depending on the situation.

10.1.3 Serious Incidents

The HSM and Legal and Insurance Department (LID) shall determine if an event should be considered as a serious incident after reviewing the initial incident facts. The general criteria for serious incidents include:

- Intervention by external emergency response organizations
- Hospitalization
- Spills and releases of hazardous substances exceeding the reportable quantity (RQ)
- Potential violations of law or regulation
- Estimated property damage in excess of $10,000

10.2 Incident Notification and Communication

Injury Reporting

- If a CH2M HILL employee is injured immediately notify their group leader.
- Call the CH2M HILL Occupational Health Nurse

1-800-756-1130

- In case of emergency call 911.

Incident Notification and Reporting

- Upon any other project incident (fire, spill, , near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- Notify and submit reports to client as required in contract.
- Serious Incidents must be reported in accordance with CH2M HILL Standard of Practice, *Serious Incident Reporting Process*, immediately. Serious incidents are those that involve any of the following:
  - Work related death, or life threatening injury or illness of a CH2M HILL employee, subcontractor, or member of the public
  - Kidnap/missing person
  - Acts or threats of terrorism
  - Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than $ 500,000 in damage.

Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community or the environment

All CH2M HILL and subcontractors' employees shall immediately report any incident in which they are involved to their direct supervisor, and the supervisor shall inform the CH2M HILL SC. The SC shall then contact the PM, HSM, and the Honeywell HSPM immediately. Immediate reporting is critical because there are certain types of incidents that must be reported to Honeywell within hours of occurrence. The Honeywell HSPM will help the team determine what needs to be reported to Honeywell, how quickly it needs to be reported to Honeywell, and who at Honeywell (local, corporate, etc) needs to be notified.

Incident communications regarding serious incidents (regardless of the party involved) shall be considered sensitive in nature and must be controlled in a confidential manner. Internal communications regarding a serious incident may be conducted with affected project, regional, and Business Group staff but must be kept to a minimum. Communication should be oral whenever possible. If e-mail communications are necessary they shall be sent as confidential emails following the procedure provided in section 6.2.2 of CH2M HILL HSE SOP-111, Incident Reporting and Investigation. A LID representative shall direct all internal and external communications, including internal incident reporting, agency reporting, client notification, and incident investigations.

The PM or the HSPM will be responsible to ensure that the incident is entered into Honeywell's event tracking system and an IRF is completed within 24 hours of any incident. The HSPM can assist with complying with entering information into Honeywell's event tracking system. CH2M HILL's requirements can be met by entering an electronic IRF directly into the IRF database. The electronic IRF is found on the CH2M HILL HS&E web page under Tools and Forms>Electronic Tools and Forms. If unable to submit an IRF electronically, the SC shall complete the hardcopy IRF provided in Attachment 12 and fax

the IRF to the human resources representative (for CH2M HILL employee injuries), the PM, or the HSM (for all other incidents) for database entry. A copy of the hard-copy form should also be sent to the Honeywell HSPM. **An IRF for a serious incident shall not be initiated until directed by a representative of the LID.**

When additional or updated information becomes available that was not included in the original IRF the PM shall forward such information to the human resources representative (for CH2M HILL employee injuries) or the HSM (for all other incidents) so that the IRF may be updated. Updates to IRF reports should also be sent to the Honeywell HSPM.

CH2M HILL staff shall comply with all applicable statutory incident reporting requirements such as those required by Federal agencies (EPA, OSHA, etc) and local authorities (police).

10.3 Incident Investigation

Incident investigations are to be initiated and completed as soon as possible, but no later than 72 hours after the incident has occurred. The level and type of investigation will be determined by Honeywell and/or the Honeywell HSPM. **All serious incidents shall be investigated as directed by a representative of the LID.** The HSM/ECC may conduct the investigation directly or may delegate this function to the SC or other party, depending on the extent of the incident and staff availability.

The Incident Investigation Guideline provided in Attachment 12 shall be followed when documenting an investigation. Typically, minor incident investigations will be completed by the HSM/ECC by including the investigation facts in the IRF. The HSM/ECC may require completion of a separate investigation report or the Root Cause Analysis Form for more extensive investigations. The HSM/ECC shall ensure that the PM and SC are made aware of investigation findings and all corrective actions, and shall verify that corrective actions are implemented to prevent further incidents.

10.4 Corrective Actions

All corrective actions recommended from the incident investigation report shall be taken to prevent recurrence of the incident. The PM or SC should hold a review meeting to discuss the incident and the corrective actions. The responsible supervisors shall be assigned to carry out the corrective actions and shall inform the SC upon successful implementation of all corrective actions.

11.0 Emergency Preparedness

An emergency may be an injury to a worker, an explosion, evacuation, fire, or chemical release. Employees must know what to do if an emergency occurs. This requires pre-planning and communication of these plans to employees.

Refer to CH2M HILL HSE SOP-106, Emergency Planning, for additional information.

11.1 Pre-Emergency Planning

The SC shall perform the following pre-emergency planning tasks before starting field activities and coordinate emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Coordinate with property owner and/or review the facility emergency and contingency plans where applicable. Have a copy readily available at the site for review and attach a copy to this HS&E Plan.
- Complete and post the Emergency Contacts form provided in the front matter of this document. The SC should confirm that all information provided on the Emergency Contacts form is accurate and appropriately updated.
- Confirm and post evacuation routes, assembly areas and route to hospital.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn)
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone)
- Communicate emergency procedures to all field staff prior to field activities.
- Post "Exit" signs above exit doors and post "Fire Extinguisher" signs above locations of extinguishers in field trailers.
- Keep areas near exits and extinguishers free of obstructions.
- Designate one vehicle as the emergency vehicle, place hospital directions and map inside, and keep keys in ignition during field activities
- Where appropriate and acceptable to the client, inform emergency room and external emergency response organizations of anticipated types of site emergencies.
- Rehearse the emergency response plan before site activities begin, including driving the route to the hospital.
- Emergency drills should be performed periodically, but at least once per year. Upon completion of each drill, the SC shall evaluate the effectiveness of the emergency plan.

Any problems or concerns identified during the evaluation must be corrected immediately.

11.2 Emergency Equipment and Supplies

The SC shall verify that appropriate emergency equipment and supplies are available, as needed, and in proper working order and mark the locations of the equipment on the site map when a map is provided. The following equipment and supplies are typically required:

- Fire Extinguishers
- First aid kit
- Bloodborne pathogen kit
- Personal eye wash station
- Potable water

11.3 Incident Response

The following actions shall be taken in the event of a fire, explosion, or chemical release:

- Shut down CH2M HILL operations and evacuate the immediate area
- Notify appropriate response personnel
- Account for personnel at the designated assembly area(s)
- Assess the need for site evacuation, and evacuate the site as warranted

11.4 Evacuation Procedures

Typical evacuation procedures include the following:

- Evacuation routes and assembly areas will be designated by the SC before work begins
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation
- The SC and a "buddy" will remain on the site after the site has been evacuated (if safe) to inform local responders of the nature and location of the incident
- The SC will account for all personnel at the assembly area
- The SC will write up a report as soon as possible after the emergency the following the guidelines provided in the Incident Report Section of the HS&E Plan.

11.5 Emergency Medical Treatment

The following actions shall be taken in the event of a medical emergency:

- Get medical attention immediately.
- Notify appropriate emergency response authorities listed on the Emergency Contacts form, as necessary.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Make certain that the injured person is accompanied to the emergency room.

The SC will assume control during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room. If the injured is a CH2M HILL employee, the SC or PM must accompany the injured CH2M HILL employee to the emergency room and to any follow-up appointments until the injured is released to full duty.

If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant. When contacting the medical consultant, state that the situation is a CH2M HILL matter, and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

The SC shall ensure that all injuries are reported according to the guidelines in the Incident Reporting and Investigation Section of this HS&E Plan.

12.0 Recordkeeping

The following records (see Table 12-1) shall be maintained as indicated. Refer to CH2M HILL SOP HSE-15 for complete recordkeeping requirements and additional information.

TABLE 12-1
Recordkeeping Requirements

Record	Location	Duration
Medical and Exposure Records	Medical & Training Administrator	Employment + 30 years
HS&E Plans	Project File; MTA	Project duration + 5 years
HS&E Training Records	Project File; HandS Database	Employment + 30 years
Environmental Documentation (permits, approvals, manifests)	Project File; HS&E Archive	Project duration + 5 years